WHAT IS CLAIMED IS:

1.   A system for optimizing the performance of a stepper motor by optimizing step-time sequence instructions given to the stepper motor, the system comprising:

a host computer having a user interface for entering commands to the stepper motor and defining a desired operation profile; and

an interface computer connected between the host computer and the stepper motor having program means for executing a real-time controller program containing an objective function and receiving real-time feedback from the stepper motor to produce optimized step-time sequence instructions, the interface transmitting the optimized step-time sequence instructions to the stepper motor.

2.   The system of claim 1, further comprising feedback means connected with the stepper motor for providing real-time feedback to the interface computer.

3.   The system of claim 1, wherein the optimized step-time sequence instructions are transmitted to the stepper motor in real-time.

4.   The system of claim 1, wherein the objective function is modified by the real-time feedback when the real-time controller program executes.

5.   An optimization system for a stepper motor, comprising:

a host computer for entering stepper motor

commands defining a desired result;

an interface computer connected between the host computer and the stepper motor having program means for comparing an objective function result to the desired result, the program means minimizing the objective function result to improve the dynamic performance of the system using a generated step-time sequence based on the desired result, the program means perturbing each time step and evaluating the objective function for each perturbation to optimize the system response.

6. A method for optimizing operation of a stepper motor based on a desired profile, the method comprising:

providing an interface computer connected with the stepper motor;

generating an objective function model for optimizing a step-time sequence for the stepper motor;

loading an optimization program including the objective function model on the interface computer;

generating an initial step-time sequence for the stepper motor;

receiving, at the interface computer, feedback from hardware on the stepper motor, the feedback containing position data;

running the optimization program on the interface computer to minimize a result from the objective function model in response to the feedback to generate an optimized step-time sequence.